

WILLARS et al
Serial No. 09/842,027

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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Cancelled)

2. (Currently Amended) A telecommunications system having an application layer and a transport layer, the system comprising:
a first node which utilizes a first transport technology;
a second node which utilizes a second transport technology;
wherein the first transport technology and the second transport technology are interworked for facilitating establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer. The system of claim 1,
wherein the application layer executes a radio network layer procedure to initiate the transport bearer in a radio access network of a wireless telecommunications system.

3. (Currently Amended) The system of claim 2, further comprising a transport layer interworking gateway connected between the first node and the second node.

4. (Currently Amended) The system of claim 3, further comprising a transport layer interworking gateway, and wherein the interworking gateway receives an establish request message carried by the first transport technology and converts an address of the second node borne by the establish request message to an address usable by the second transport technology, and wherein the interworking gateway employs the address usable by the second transport technology to send a bearer signaling message to the second node.

5. (Currently Amended) The system of claim 4, wherein the first technology is ATM and the second technology is internet protocol (IP).

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6. (Original) The system of claim 5, wherein the bearer signaling message is in an IP bearer control protocol and includes a binding identifier obtained from the second node.

7. (Original) The system of claim 6, wherein after receipt of the bearer signaling message the second node sends an IP response message to the interworking gateway, the IP response message including information enabling establishment of a unidirectional connection from the interworking gateway to the second node.

8. (Original) The system of claim 7, wherein after receipt of the IP response message, the interworking gateway sends an establish confirmation message to the first node.

9. (Currently Amended) The system of claim 32, further comprising a transport layer interworking gateway, and wherein the first node uses an address of the second node to determine an address for the interworking gateway, and wherein the first node sends a bearer signaling message to the interworking gateway.

10. (Original) The system of claim 9, wherein the bearer signaling message is in an IP bearer control protocol and includes an address of the second node, a binding identifier obtained from the second node, and IP connection information necessary for the interworking gateway to establish a unidirectional connection to the first node.

11. (Original) The system of claim 10, wherein upon receiving the bearer signaling message, the interworking gateway sends an establish request message towards the second node, and wherein upon receipt of the establish request message the second node sends an establish confirmation message toward the interworking gateway.

12. (Original) The system of claim 11, wherein the establish request message and the establish confirmation message are q.aal2 messages.

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13. (Original) The system of claim 11, wherein upon receipt of the establish confirmation message the interworking gateway sends an IP response message to the first node, the IP response message including IP connection information necessary for the first node to establish a unidirectional connection to the interworking gateway.

14. (Currently Amended) The system of claim 12, wherein an interworking function interworks the first technology and the second technology at one of the first node and the second node.

15. (Currently Amended) The system of claim 12, wherein an interworking function interworks the first technology and the second technology at a node distinct from the first node and the second node.

16. (Currently Amended) A telecommunications system having an application layer and a transport layer, the system comprising:
a first node which utilizes a first transport technology;
a second node which utilizes a second transport technology;
wherein the first transport technology and the second transport technology are interworked for facilitating establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer. The system of claim 1,
wherein an interworking function interworks the first technology and the second technology using q.aal2 signaling.

17. (Original) The system of claim 16, wherein one of the transport technologies is an internet protocol (IP), and wherein the interworking function involves using internet protocol (IP) specific signaling over an internet protocol (IP) network.

18. (Original) The system of claim 16, wherein one of the first and the second node is an internet protocol (IP) node, and wherein the interworking function involves using q.aal2 signaling over an internet protocol (IP) network to/from the internet protocol (IP) node.

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19. (Currently Amended) A telecommunications system having an application layer and a transport layer, the system comprising:
a first node which utilizes a first transport technology;
a second node which utilizes a second transport technology;
wherein the first transport technology and the second transport technology are interworked for facilitating establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer. The system of claim 1,

wherein the first node is an IP-connected node which attempts to establish the transport bearer using application level signaling, but when unsuccessful invokes an interworking function for establishing the transport bearer.

20. (Currently Amended) A telecommunications system having an application layer and a transport layer, the system comprising:
a first node which utilizes a first transport technology;
a second node which utilizes a second transport technology;
wherein the first transport technology and the second transport technology are interworked for facilitating establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer. The system of claim 1,

wherein the first node is an IP-connected node which includes its IP address and IP endpoint identifier for uplink traffic in an IP transport bearer container sent to the second node in an initiating application control message, wherein if an IP transport bearer container is received from the second node in an application control response message, the transport bearer is considered as being established, and otherwise the interworking function is invoked by the first node.

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21. (Currently Amended) A telecommunications system having an application layer and a transport layer, the system comprising:
a first node which utilizes a first transport technology;
a second node which utilizes a second transport technology;
wherein the first transport technology and the second transport technology are interworked for facilitating establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer. The system of claim 1,

wherein an IP-connected node obtains address parameters of a transport layer interworking gateway from the transport layer interworking gateway for inclusion in application layer signaling to the first node.

22. (Original) The system of claim 21, wherein the first node is not an IP-connected node but the second node is an IP-connected node, wherein upon receipt of an initiating application message from the first node, the second node obtains from the transport level interworking gateway a network address of the interworking gateway and a binding identifier of the interworking gateway to send back to the first node, wherein the second node establishes a bidirectional IP connection with the interworking gateway; and wherein the first node uses the network address of the interworking gateway and the binding identifier of the interworking gateway to establish a connection with the interworking gateway.

23. (Currently Amended) A telecommunications system having an application layer and a transport layer, the system comprising:
a first node which utilizes a first transport technology;
a second node which utilizes a second transport technology;
wherein the first transport technology and the second transport technology are interworked for facilitating establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer. The system of claim 1,
wherein a tunneling mechanism is utilized to interwork the first technology and the second technology.

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24. (Cancelled)

25. (Currently Amended) For use in a telecommunications system having an application layer and a transport layer, the system comprising a first node which utilizes a first transport technology and a second node which utilizes a second transport technology, a method comprising:

interworking the first transport technology and the second transport technology to facilitate establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer; The method of claim 24, further comprising

executing at the application layer a radio network layer procedure to establish the transport bearer in a radio access network (RAN) of a wireless telecommunications method.

26. (Currently Amended) The method of claim 24, further comprising connecting a transport layer interworking gateway connected between the first node and the second node.

27. (Currently Amended) The method of claim 26, further comprising: receiving at the an interworking gateway an establish request message carried by the first transport technology;

converting an address of the second node borne by the establish request message to an address usable by the second transport technology;

the interworking gateway employing the address usable by the second transport technology to send a bearer signaling message to the second node.

28. (Original) The method of claim 27, wherein the first technology is ATM and the second technology is an internet protocol (IP).

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29. (Original) The method of claim 28, wherein the bearer signaling message is in an IP bearer control protocol and includes a binding identifier obtained from the second node.

30. (Original) The method of claim 29, further comprising, after receipt of the bearer signaling message, the second node sending an IP response message to the interworking gateway, the IP response message including information enabling establishment of a unidirectional connection from the interworking gateway to the second node.

31. (Original) The method of claim 30, further comprising, after receipt of the IP response message, the interworking gateway sending an establish confirmation message to the first node.

32. (Currently Amended) The method of claim 2625, further comprising:
the first node using an address of the second node to determine an address for the an interworking gateway; and
the first node sending a bearer signaling message to the interworking gateway.

33. (Original) The method of claim 32, wherein the bearer signaling message is in an IP bearer control protocol, and wherein the method comprises including in the IP bearer signaling message an address of the second node, a binding identifier obtained from the second node, and IP connection information necessary for the interworking gateway to establish a unidirectional connection to the first node.

34. (Original) The method of claim 33, further comprising:
upon receiving the bearer signaling message, the interworking gateway sending an establish request message towards the second node; and
upon receipt of the establish request message the second node sending an establish confirmation message toward the interworking gateway.

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35. (Original) The method of claim 34, wherein the establish request message and the establish confirmation message are q.aal2 messages.

36. (Original) The method of claim 34, further comprising upon receipt of the establish confirmation message the interworking gateway sending an IP response message to the first node, the IP response message including IP connection information necessary for the first node to establish a unidirectional connection to the interworking gateway.

37. (Currently Amended) The method of claim 2425, further comprising using an interworking function to interwork the first technology and the second technology at one of the first node and the second node.

38. (Currently Amended) The method of claim 2425, further comprising using an interworking function to interwork the first technology and the second technology at a node distinct from the first node and the second node.

39. (Currently Amended) For use in a telecommunications system having an application layer and a transport layer, the system comprising a first node which utilizes a first transport technology and a second node which utilizes a second transport technology, a method comprising:

interworking the first transport technology and the second transport technology to facilitate establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer. The method of claim 24, further comprising
using q.aal2 signaling to interwork the first technology and the second technology.

40. (Original) The method of claim 39, wherein one of the transport technologies is an internet protocol (IP), and further comprising performing interworking using internet protocol (IP) specific signaling over an internet protocol (IP) network.

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41. (Original) The method of claim 39, wherein one of the first and the second node is an internet protocol (IP) node, and further comprising performing interworking using q.aal2 signaling over an internet protocol (IP) network to/from the internet protocol (IP) node.

42. (Currently Amended) For use in a telecommunications system having an application layer and a transport layer, the system comprising a first node which utilizes a first transport technology and a second node which utilizes a second transport technology, wherein the first node is an IP-connected node, a method comprising:
interworking the first transport technology and the second transport technology to facilitate establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer; The method of claim 24, wherein the first node is an IP-connected node, and further comprising:

the first node attempting to establish the transport bearer using application level signaling, but when unsuccessful the first node invoking an interworking function for establishing the transport bearer.

43. (Currently Amended) For use in a telecommunications system having an application layer and a transport layer, the system comprising a first node which utilizes a first transport technology and a second node which utilizes a second transport technology, wherein the first node is an IP-connected node, a method comprising:
interworking the first transport technology and the second transport technology to facilitate establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer; The method of claim 24, wherein the first node is an IP-connected node, and wherein the method further comprises:

the first node including its IP address and IP endpoint identifier for uplink traffic in an IP transport bearer container sent to the second node in an initiating application control message;

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wherein if an IP transport bearer container is received from the second node in an application control response message, considering the transport bearer to be established, and otherwise invoking interworking by the first node.

44. (Currently Amended) For use in a telecommunications system having an application layer and a transport layer, the system comprising a first node which utilizes a first transport technology and a second node which utilizes a second transport technology, wherein the second node is an IP-connected node, a method comprising:
interworking the first transport technology and the second transport technology to facilitate establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer; The method of claim 24, wherein the second node is an IP-connected node, the method further comprising:

obtaining address parameters of a transport layer interworking gateway from the transport layer interworking gateway for inclusion in application layer signaling to the first node.

45. (Original) The method of claim 44, wherein the first node is not an IP-connected node but the second node is an IP-connected node, the method further comprising:

upon receipt of an initiating application message from the first node, the second node obtaining from the transport level interworking gateway a network address of the interworking gateway and a binding identifier of the interworking gateway to send back to the first node;

the second node establishing a bidirectional IP connection with the interworking gateway; and

the first node using the network address of the interworking gateway and the binding identifier of the interworking gateway to establish a connection with the interworking gateway.

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46. (Currently Amended) For use in a telecommunications system having an application layer and a transport layer, the system comprising a first node which utilizes a first transport technology and a second node which utilizes a second transport technology, a method comprising:

interworking the first transport technology and the second transport technology to facilitate establishment of a transport bearer between the first node and the second node without terminating or interworking with application control signaling in the application layer. The method of claim 24, further comprising

using a tunneling mechanism to interwork the first technology and the second technology.

47. (Original) A telecommunications system having an application layer and a transport layer, the application layer being a radio network layer, the system comprising:

a first node which is connected to use Internet Protocol;

a second node;

wherein the first node attempts to establish a transport bearer between the first node and the second node using application level signaling, but when unsuccessful invokes an interworking function in the transport layer for establishing the transport bearer.

48. (Original) The system of claim 47, wherein the first node includes its IP address and IP endpoint identifier for uplink traffic in an IP transport bearer container sent to the second node in an initiating application control message, and wherein if an IP transport bearer container is received from the second node in an application control response message, the transport bearer is considered as being established, and otherwise the interworking function is invoked by the first node.

49. (Original) The system of claim 47, further comprising a transport layer interworking gateway connected between the first node and the second node.

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50. (Original) The system of claim 49, wherein the interworking gateway receives an establish request message carried by the first transport technology and converts an address of the second node borne by the establish request message to an address usable by the second transport technology, and wherein the interworking gateway employs the address usable by the second transport technology to send a bearer signaling message to the second node.

51. (Original) The system of claim 50, wherein the first technology is ATM and the second technology is an internet protocol (IP).

52. (Original) The system of claim 51, wherein the bearer signaling message is in an IP bearer control protocol and includes a binding identifier obtained from the second node.

53. (Original) The system of claim 52, wherein after receipt of the bearer signaling message the second node sends an IP response message to the interworking gateway, the IP response message including information enabling establishment of a unidirectional connection from the interworking gateway to the second node.

54. (Original) The system of claim 53, wherein after receipt of the IP response message, the interworking gateway sends an establish confirmation message to the first node.

55. (Original) The system of claim 47, wherein the first node uses an address of the second node to determine an address for the interworking gateway, and wherein the first node sends a bearer signaling message to the interworking gateway.

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56. (Original) For use in a telecommunications system having an application layer and a transport layer, the application layer being a radio network layer, the system comprising a first node which is connected to use Internet Protocol and a second node, a method comprising attempting to establish a transport bearer between the first node and the second node using application level signaling, but when unsuccessful invoking an interworking function in the transport layer for establishing the transport bearer.

57. (Original) The method of claim 56, further comprising:
the first node including its IP address and IP endpoint identifier for uplink traffic in an IP transport bearer container sent to the second node in an initiating application control message;
upon receiving an IP transport bearer container from the second node in an application control response message, considering the transport bearer as being established, but
otherwise invoking the interworking function.

58. (Original) The method of claim 56, further invoking the interworking function involves accessing a transport layer interworking gateway connected between the first node and the second node.

59. (Original) The method of claim 58, further comprising:
upon receiving at the interworking gateway an establish request message carried by the first transport technology, converting an address of the second node borne by the establish request message to an address usable by the second transport technology; and employing the address usable by the second transport technology to send a bearer signaling message to the second node.

60. (Original) The method of claim 59, wherein the first technology is ATM and the second technology is an internet protocol (IP).

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61. (Original) The method of claim 60, further comprising forming the bearer signaling message in an IP bearer control protocol and including in the bearing signanling message a binding identifier obtained from the second node.

62. (Original) The method of claim 61, further comprising after receipt of the bearer signaling message, the second node sending an IP response message to the interworking gateway, the IP response message including information enabling establishment of a unidirectional connection from the interworking gateway to the second node.

63. (Original) The method of claim 62, further comprising, after receipt of the IP response message, the interworking gateway sending an establish confirmation message to the first node.

64. (Original) The method of claim 63, further comprising:
the first node using an address of the second node to determine an address for the interworking gateway; and
the first node sending a bearer signaling message to the interworking gateway.

65. (Original) A telecommunications system having an application layer and a transport layer, the application layer being a radio network layer, the system comprising:
a first node;
a second node which is connected to use Internet Protocol;
a transport layer interworking gateway;
wherein the second node obtains address parameters of the transport layer interworking gateway from the transport layer interworking gateway for inclusion in application layer signaling to the first node in order to enable the first node to use the transport layer interworking gateway for the purpose of establishing a transport bearer between the first node and the second node.

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66. (Original) The system of claim 65, wherein the first node is not an IP-connected node but the second node is an IP-connected node, wherein upon receipt of an initiating application message from the first node, the second node obtains from the transport level interworking gateway a network address of the interworking gateway and a binding identifier of the interworking gateway to send back to the first node, wherein the second node establishes a bidirectional IP connection with the interworking gateway; and wherein the first node uses the network address of the interworking gateway and the binding identifier of the interworking gateway to establish a connection with the interworking gateway.

67. (Original) For use in a telecommunications system having an application layer and a transport layer, the application layer being a radio network layer; the system comprising a first node, a second node which is connected to use Internet Protocol; and a transport layer interworking gateway; a method comprising:

the second node obtaining address parameters of the transport layer interworking gateway for inclusion in application layer signaling to the first node, thereby enabling the first node using the transport layer interworking gateway for the purpose of establishing a transport bearer between the first node and the second node.

68. (Original) The method of claim 67, wherein the first node is not an IP-connected node but the second node is an IP-connected node, further comprising:
upon receipt of an initiating application message from the first node, the second node obtaining from the transport level interworking gateway a network address of the interworking gateway and a binding identifier of the interworking gateway for the second node to send back to the first node;

the second node establishing a bidirectional IP connection with the interworking gateway;

the first node using the network address of the interworking gateway and the binding identifier of the interworking gateway to establish a connection with the interworking gateway.